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# Forest Health Protection

## Pacific Southwest Region



Date: July 2, 2002  
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To: Forest Supervisors: Lassen, Plumas, Modoc, and Tahoe National Forests

Subject: Follow-up monitoring report for Douglas-fir tussock moth, larval survey results for 2002. (FHP Report NE02-05)

### Summary

Thirteen Douglas-fir tussock moth (DFTM) trap plots had levels of moths high enough in 2001 to trigger subsequent life stage sampling this summer. Trees were sampled in all plots in late June 2002 for DFTM larvae. All plots surveyed had low levels of DFTM larvae and do not have the potential to reach outbreak levels this year. I did notice some evidence of feeding in the small, understory trees in the three plots on the Tahoe National Forest. It is important to note that population monitoring is only conducted over a small proportion of the total area of the white fir host type and that field going personnel should monitor for evidence of larval feeding on an informal day-to-day basis, as well as during aerial reconnaissance and aerial mortality survey flights.

### Background

The Douglas-fir tussock moth (DFTM), *Orgyia pseudotsugata* (Lepidoptera: Lymantriidae), is a native defoliator of true firs and Douglas-fir in western North America. The primary host in California is white fir, *Abies concolor*. Feeding by high densities of larvae can result in tree

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mortality, top-kill and growth loss. These outcomes can have diverse effects on forest ecosystems and resource management objectives.

Douglas-fir tussock moth populations periodically reach outbreak levels in California (Table 1). Outbreaks of DFTM are usually detected after some foliage damage has already occurred. In an effort to identify areas where DFTM populations are starting to increase toward outbreak levels, an “early warning” monitoring system has been implemented throughout the west, including northeastern California. Many personnel on Ranger Districts and within other agencies cooperate with FHP on an annual basis in conducting adult moth monitoring. This system uses traps baited with synthetic DFTM female pheromones to catch male moths (Daterman et al., 1976; 1979). The number of male moths captured can be an indication of the number of larvae that will be present the following spring and help identify areas where populations are increasing toward outbreak levels. The intent of implementing the “early warning” system is to give resource managers time to conduct decision support activities and allow for more timely decision-making regarding potential management activities.

Table 1. The location, duration and size of major DFTM outbreaks in California since 1935.

<b>Years</b>	<b>Location (County)</b>	<b>Acres of Defoliation</b>
1935-1937	Mono	15,000 acres
1954-1956	Calaveras, Tuolumne	11,000 acres
1963-1965	Modoc, Plumas, Lassen, El Dorado	78,000 acres
1970-1972	Amador, Calaveras, El Dorado, Fresno, Madera, Mariposa, Shasta, Tulare, Tuolumne	100,000+ acres
1987-1989	Lassen, Plumas, Sierra, Tehama	105,000 acres
1998	Fresno, Tulare	44,000 acres
1999	Modoc	2,200 acres

### **Monitoring Results**

In the fall of 2001, pheromone trap catches indicated that DFTM populations were increasing in 13 plot locations in northeastern California (see FHP Report NE02 – 1). Subsequently, larval surveys were conducted in June 2002. The purpose of this report is to convey the results on the monitoring surveys and remind field going personnel to be on the look out for defoliation.

#### **1) Early warning monitoring pheromone traps.**

An average trap catch of 25 or more moths per trap indicates that populations may be increasing toward outbreak levels (Daterman et al. 1979). Results of the pheromone trap catches for plots in northeastern California that exceeded 25 moths/trap in 2001 are listed in Table 2.

## 2) Larval monitoring.

Larval monitoring was conducted in late June 2002 using a lower crown beating technique (Mason 1977; 1979). This technique involves knocking early stage DFTM larvae from the lower branches of white fir onto a drop cloth, determining the proportion of trees with larvae present, and converting the proportion of trees infested to an estimated mid-crown density expressed as the number of DFTM larvae per 0.64 sq. m. (1000 sq. in) of foliage. Tussock moth defoliation usually becomes conspicuous (outbreak threshold level) at about 20 early stage larvae/0.64 sq. m. Densities of about 3 larvae/0.64 sq. m. and greater have the potential to increase to outbreak levels the following year and are considered suboutbreak; densities of less than 1 larvae/0.64 sq. m. are at least two years away from reaching outbreak levels and are considered low-level (Mason 1978). Results of the larval sampling in June 2002 using the lower crown beating method are listed in Table 2 as estimated mid-crown density. The populations in all plots surveyed are classified as being **below** the suboutbreak level for 2002 and are considered to be at a low levels.

Table 2. DFTM monitoring results for 2001 moth catches and 2002 larval surveys.

Forest	Ranger District	Plot Name	Average Moths/Trap 2001	Estimated Mid-crown density
Tahoe	Downieville	Bald Top	28.6	0
	Nevada City	Diamond 2	27.7	0
		Chalk Bluff	34.0	0
Modoc	Big Valley	Johnson Spring 2	25.2	0.16
Plumas	Beckwourth	3 Mile Rock	28.6	0
		Meadow Creek	33.8	0
	Mt. Hough	B4 1-10	40.8	0
		B4 11-20	29.8	0.33
		B5 11-20	46.0	0.16
		B5 21-30	33.4	0.33
		B6 1-10	25.0	0
Lassen	Eagle Lake	Stephens	31.2	0.16
		Crazy Harry	28.0	0.16

## Discussion

Based on the results of the lower crown sampling, all plots surveyed had low levels of DFTM larvae and do not have the potential to reach outbreak levels this year. I did notice some evidence of feeding in the small, understory trees in the three plots on the Tahoe National Forest. It is important to note that population monitoring is only conducted over a small proportion of the total area of the white fir host type and that field going personnel should monitor for evidence of larval feeding on an informal day-to-day basis, as well as during aerial reconnaissance and aerial mortality survey flights. Browning and shriveling of the current years needles and loss of the older needles characterize feeding injury/damage, which may be evident in the upper crown. In addition, silk strands or tents (produced by the larvae) primarily in the

upper crown may be evident and from mid to late-July through August, relatively large (25 to 30 mm) hairy, colorful larvae may be present on the foliage or along tree boles.

Early warning trapping materials for 2002 have been sent to all cooperators. We appreciate your continued assistance in monitoring DFTM populations on your Forests. If you detect any DFTM defoliation this summer or have questions regarding this report please contact me at 530-252-6667 or [ssmith@fs.fed.us](mailto:ssmith@fs.fed.us).



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## References

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